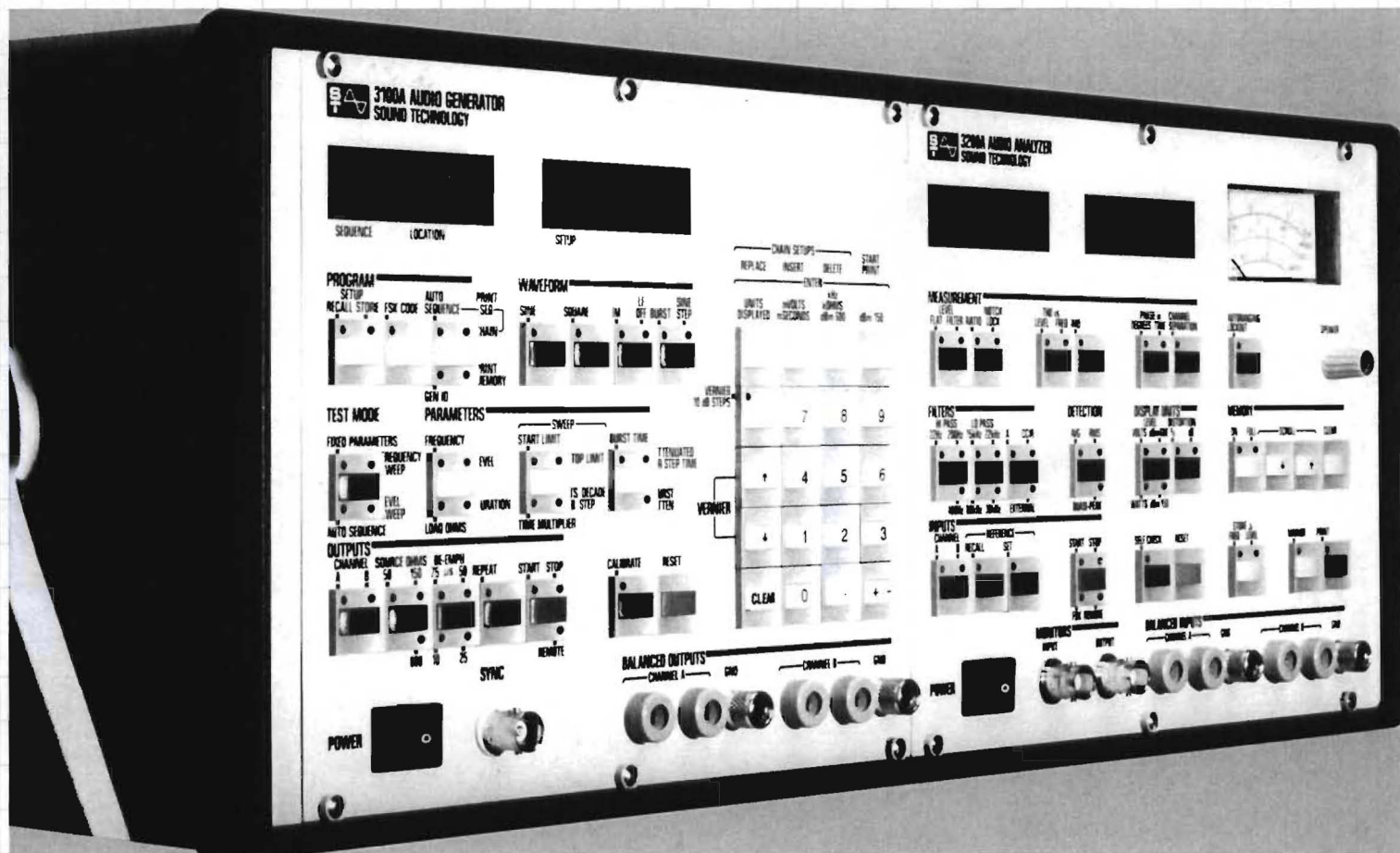


MODEL 3000A PROGRAMMABLE AUDIO TEST SYSTEM

SOUND TECHNOLOGY



The ST 3000A has the following exclusive features:

- **MANUAL MODE.** Use the system *manually* when troubleshooting.
- **INTERNAL-PROGRAMMING MODE.** Store and chain up to 80 different front panel set-ups into 16 different "proof" locations. Perform automated check-outs without computers!
- **EXTERNAL COMPUTER AUTOMATION.** You can automate the ST 3000A using *any* computer having GPIB or RS-232 capability! Or, simplify your automation task by utilizing our IBM™/Compatible bundled software modules.
- **COMPREHENSIVE HARD COPY.** Obtain complete *tabular and graphic* printout directly from the ST 3000A to an inexpensive Epson™ compatible dot matrix printer.
- **INDUSTRY-LEADING SPECIFICATIONS.** Will test the best 16-bit digital systems!

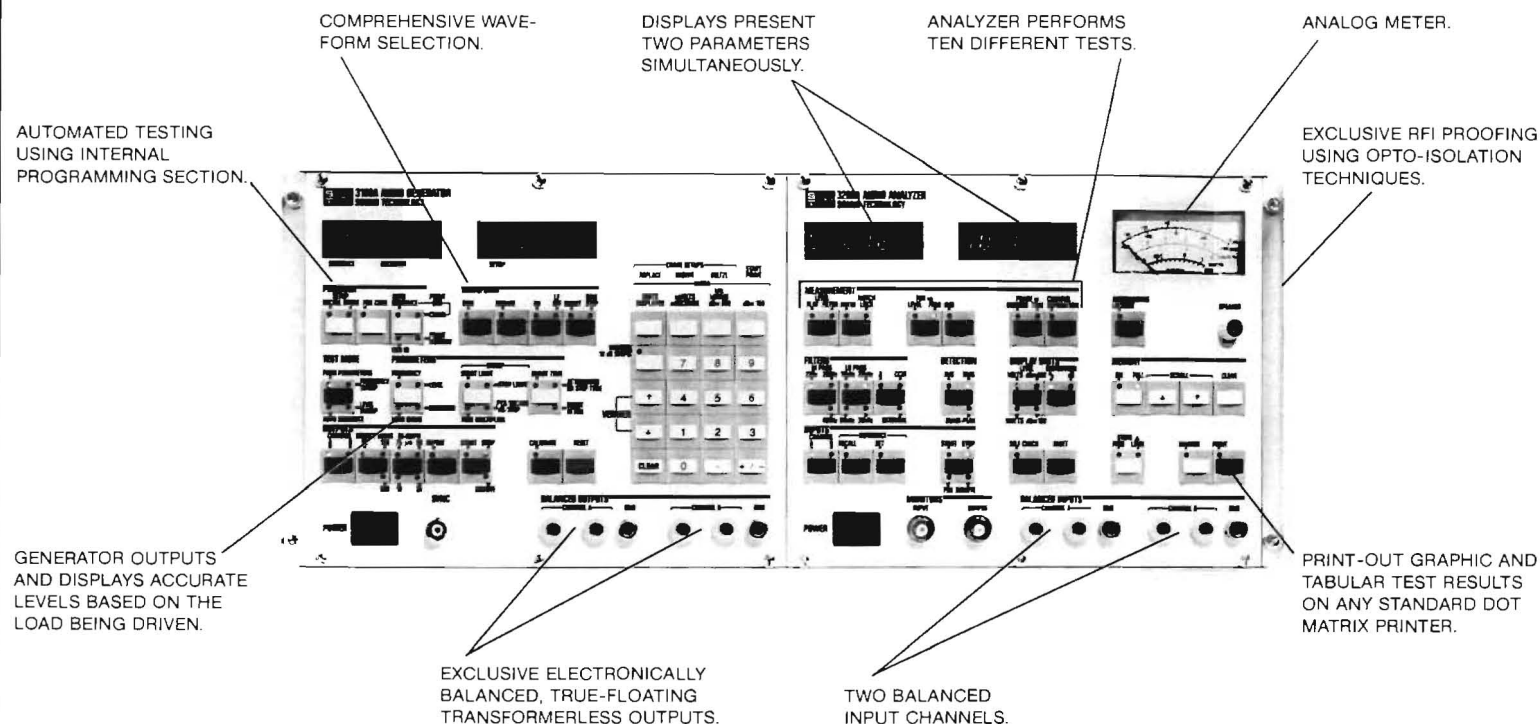
communications protocols:



SOUND TECHNOLOGY

Represented by
Atlantic Marketing
Charlotte, NC
(704) 542-3380

3000A PROGRAMMABLE AUDIO TEST SYSTEM



The Sound Technology 3000 Series... The NEW generation in audio testing!

The ST3000 Series design philosophy combines the "best of all worlds" for audio testing in one package. You can use the instruments *manually*, use *internal automation* or *externally automate* using one of the 3000 series' industry standard interface busses!

AUTOMATED BENCH-TOP TESTING

Simple bench-top automation results from Sound Tech's unique use of FSK (frequency-shift-keying) generator-to-analyzer communication. The use of FSK, which is transmitted through the audio line(s) or circuits being tested, allows for *automation without external computers*! Up to 16 proofs or test sequences can be built into the Generator's programming section. Running a proof is as easy as recalling a two-digit number and pushing "start"!

MANUAL MODE

Up until now, when purchasing an audio test system you had to make a choice. A choice between manual or automated testing. The conflict exists because Engineers naturally prefer a manual "mode" of operation when troubleshooting, and they prefer automation when they want to get an overall performance picture.

The solution is the 3000 Series. It excels both in manual use and under automated control. Easy to understand and use front panels make manual troubleshooting easy. Exclusive *two LED displays* on both the Generator and Analyzer give you twice the information of competitive systems. And, the Analyzer's exclusive *Memory Storage* section is continually storing away test results for your later use.

COMPREHENSIVE WAVEFORMS AND ANALYSIS

More than just a sinewave generator,

the 3100A is a low distortion function generator having the following waveform capabilities:

Sinewave: 1 Hz to 102.39 kHz
Squarewave: 1 Hz to 50 kHz
SMPTE-IMD: 7 kHz on 60 Hz, 4:1
Toneburst: 100 Hz to 102.39 kHz
Sine/Step: 100 Hz to 102.39 kHz
* Denotes an option.

All of the above waveforms are generated by the world's best generator: a *transformerless, electronically balanced—true floating* two-channel output generator. This digitally controlled, analog oscillator runs "RF cool" as the enclosed oscillator is isolated from the multi-layered pc board digital control section using opto-isolators. There is no electrical connection between the digital control circuits and the analog oscillator—therefore, no RF or digital "hash" path to the oscillator. Engineers are amazed to sweep either the Generator or Analyzer out into the MHz regions and

find no digital hash or clock frequencies in the spectrum.

Because the balanced outputs are truly floating and transformerless, you can single-end either side to ground without loss of level. Also, you can output a clean (~90 dBm) signal in order to test well below mic-line levels: the oscillator attenuates the noise as well as the signal (over 100 dB of attenuation after the power amp)!

The 3200A Analyzer is no less comprehensive. The analyzer measures the following:

Frequency to 500 kHz
Flat Level to 350 kHz
Filtered Level to 350 kHz
Ratio
Notch Lock*
ThD vs. Level (300 kHz BW)
ThD vs. Freq. (300 kHz BW)
SMPTE IMD*
Φ Error in Degrees to 40 kHz
Φ Error in Time to 40 kHz
Channel Separation to 100 kHz

HARD COPY PRINTOUT

Both the Generator and Analyzer sections of the 3000A test system have printout capability through their respective Centronics parallel ports.

The Generator can download a print-out of all programming contained in its memory section.

The Analyzer automatically stores test results in its battery-protected memory section. Test results can be printed out in Tabular or Graphic (option) formats. Analyzer test results also include Generator ID information, as well as time and date.

TABULAR PRINTOUT

The standard 3000A test system prints out test results in tabular fashion. Each individual test is broken out and given its own test number on a sequential basis. For example, the printout to the right is a ThD vs. Frequency test described as TEST No. 3. The Analyzer memory section can hold over 1,000 lines of test result (up to 3,000 actual measurements).

TEST No. 3

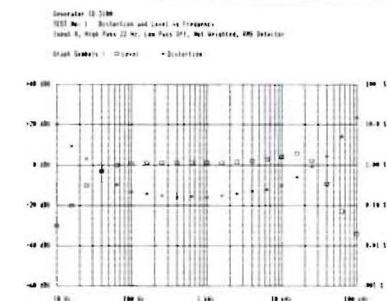
Generator ID :	1000000000000000		
Input A	High Pass 22 Hz Low Pass 80kHz Not Weighted		
RMS Detector	FREQUENCY	LEVEL	
THD	0.0013 %	10.063 kHz	0.70 dBu
	0.0013 %	6.351 kHz	0.70 dBu
	0.0014 %	4.007 kHz	0.70 dBu
	0.0017 %	2.520 kHz	0.70 dBu
	0.0017 %	1.595 kHz	0.70 dBu

GRAPHIC PRINTOUT (option)

22 different tests can be printed graphically directly from the Analyzer to any Epson™ compatible printer. No computer interface is necessary.

The graph shown to the right is a reduction. The graph's actual size is 6.12" wide by 5.00" tall. Two graphs fit on a standard 8.5" by 11" sheet of paper.

A user can also select a combined Graphics + Tabular printout.



All measurements are fully automatic. Merely select the test and press "Start." Two LED displays autorange and show two parameters simultaneously. For example, 'A' channel Level will show the incoming frequency on the left display and Level on the right display. The LED readings will keep updating in real-time until the "Stop" button is depressed. No range changing or scaling is necessary.

INDUSTRY-LEADING SPECIFICATIONS

The 3000 Series was designed for testing 16-bit digital audio systems.

The 3000 Series specifications are some of the best to be found. We welcome comparison to any other audio test system regardless of where manufactured. Beware of confusing specification claims when shopping for a new audio test system!

BENCH-TOP TESTING

FSK automation lends itself to bench-

top testing. Auto-sequences can be designed entirely for audio equipment check-out purposes. Also, FSK automation can be recorded on audio and video tape recorders such that automated 2-head type testing can be accomplished without external-computer control.

EXTERNAL COMPUTER AUTOMATION

The 3000 series can also be controlled using external personal computers. The 3000 series is controlled using standard interface busses (GPIB and RS-232C). By using a standard interface we allow you to configure the 3000 series with other automated test systems. Sound Technology also sells bundled IBM-pc/compatible software modules for use with our automated systems. With these modules, no software experience is necessary to automate ST equipment.

SPECIFICATIONS

GENERATOR

Sinewave, Toneburst, Sine/Step

Minimum Frequency: 1 Hz (10 Hz during automatic sweep or panel recall)
Maximum Frequency: 102.39 kHz \pm 4% Vernier
Frequency Accuracy: .03% fixed parameters
.1% automatic sweep
Frequency Resolution: .01% 10 Hz to 102.39 kHz
Frequency Sweep: User selectable 4 to 255 pts/decade, internally calculated to provide linear increments on a log-frequency scale; start and stop frequencies selectable from 10 Hz to 102.39 kHz. Sweeps up or down.
Level Sweep: User selected end points in dBm (600 or 150). dB/STEP keyed-in .05 dB to 20.00 dB. Sweeps up or down.

Squarewave

Minimum Frequency: 1 Hz
Maximum Frequency: 50 kHz
Risetime: less than 1 μ sec, controlled by 3-pole, linear phase filter.

SMPTE IMD (option 004)

IMD Residual Distortion: < .001%

Toneburst (option 005)

Toneburst Time On/Off adjust: 5 msec to 9,999.9 sec.
Toneburst Off adjust: burst off set from 5 to 60 dB in 5 dB increments

Sine/Step (option 005)

Sine/step Sine On/Step On adjust: 5 msec to 9,999.9 sec.

General

Maximum Output: 30.65 dBm/600 Ω load
Balanced or 30.00 dBm/both channels loaded
Unbalanced) 30.00 dBm/150 Ω load
24.00 dBm/150 Ω , both channels loaded

Maximum open circuit voltage: 28.6

Minimum Level: -90 dBm (24.5 μ V)

THD at Maximum Output: < .0008% to 10 Hz to 20 kHz
< .0015% to 50 kHz
.008% to 100 kHz

10 Hz to 20 kHz Flatness: 0.1 dB; .15 dB to 100 kHz

Level Accuracy at Mid-band: 0.2 dB

Level Resolution: .05 dB

600 Ω Source Resistance Tolerance: \pm 0.5% (-0.35% both channels loaded)*

150 Ω Source Resistance Tolerance: \pm 2% (-5.6% both channels loaded)*

50 Ω Source Resistance Tolerance: \pm 3%

Selectable Load Resistance: Key-in 50 Ω to 99,999 k Ω

Number of Channels: 2

Balance: > 120 dB (Floating, DC coupled)

Separation: > 100 dB to 20 kHz, > 80 dB to 100 kHz

Sync Output: 5 V positive-going squarewave - follows (Ground Lo Freq on IMD and Burst Envelope on Referenced)

De-emphasis: 10 μ sec, 25 μ sec, 50 μ sec or 75 μ sec. (option 006) Applies to all functions

De-emphasis Accuracy: .02 dB

* Output Level is automatically corrected for 2-channel loading.

ANALYZER

Level, Flat or Filtered

Units: Volts, dBm 600, dBm 150, Watts (8 Ω)
Bandwidth: > 300 kHz
Ranges: 30 μ V to 100 V, Autoranging
Filtered: one each of Hi Pass and/or Lo Pass
Common Mode Rejection: > 100 dB at 60 Hz
Residual Noise: < 4 μ V with 80 kHz B.W.
10 μ V with 300 kHz B.W.

ANALYZER, cont'd.

Ratio

Measures against user set reference level
Units: dB
Filters: Hi Pass, Lo Pass and Weighting selectable

THD

Units: % or dB
Range: .001% to 100% full scale
Residual Distortion: < .001% 10 to 20 kHz*
< .002% to 50 kHz
.008% to 100 kHz

Residual Noise: < 4 μ V with 80 kHz B.W.
*using 80 kHz filter

Measurement bandwidth: > 300 kHz
Fundamental Rejection: > 10 dB below residual noise + Distortion

Accuracy: \pm 1 dB to 20 kHz, \pm 2 dB to 100 kHz
Minimum Level: 30 mV

Notch Lock (option 010)

Same as ratio except Notch Filter used. Notch auto-nulls with signals above 0.1 V, then locks-up when signal drops below 0.1 V. Time for ensuing measurement of noise in the presence of a low level signal (e.g., quantization noise): approx. 30 sec.

IMD (SMPTE - option 004)

Residual Noise + Distortion: < .002%
Accuracy: \pm 1 dB
Frequencies: 60 Hz, 7 kHz

Phase

Range: \pm 180.0°
Frequency: 10 Hz to 40 kHz
Level: 50 mV to 100 V
Accuracy: \pm 0.8°
Resolution: 0.1°

Channel Separation

Measures cross-talk into selected channel
Residual cross-talk: 100 dB to 20 kHz
80 dB to 100 kHz

General

Input Channels: 2
Frequency Measuring Error: .01%
Frequency Measuring Resolution: 5 digits
Flatness: 20 Hz to 50 kHz: < 0.1 dB
50 kHz to 100 kHz: < 0.2 dB
10 Hz to 20 Hz: < 0.3 dB
Crest Factor: 6
Detectors: AVG, RMS, Q-PEAK
LP Filters: 80 kHz, 30 kHz, 22 kHz, 15 kHz
HP Filters: 22 Hz, 200 Hz, 400 Hz

THD Measuring Speed (Sweep, autoranging off)

at 10 Hz - 5.0 seconds/reading

at 100 Hz - 1.25 seconds/reading

at 1 kHz and above - 1.0 seconds/reading

Amplitude Measuring Speed (Sweep, autoranging off)

at 10 Hz - 2.5 seconds/reading

at 100 Hz - 650 msec/reading

at 1 kHz and above - 500 msec/reading

(Double above times for "autoranging ON")

SYSTEM

Power: 100, 120, 220, 240 V, 48-66 Hz, 140 W.
Dimensions: HWD: 8.0 \times 18.5 \times 17.4" (20 \times 47 \times 44 cm).
(Handle adds additional 2.0" (5 cm) to width).
Weight: Net/Ship: 52 lbs (24 kg) / 59 lbs (27 kg).
Environmental: 90% RH, +50 to +104° F (+10 to +40° C).



SOUND TECHNOLOGY

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